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# *Indian Standard*

# SPECIFICATION FOR PAPER COATED HIGH DENSITY POLYETHYLENE WOVEN SACKS FOR PACKING SKIM MILK POWDER

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**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

**Gr 2** *April* 1987

# *Indian Standard*

# SPECIFICATION FOR PAPER COATED HIGH DENSITY POLYETHYLENE WOVEN SACKS FOR PACKING SKIM MILK POWDER

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# *Indian Standard*

# SPECIFICATION FOR PAPER COATED HIGH DENSITY POLYETHYLENE WOVEN SACKS FOR PACKING SKIM MILK POWDER

## 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 16 September 1986, after the draft finalized by the Textile Materials Made from Polyolefins ( Excluding Cordage ) Sectional Committee had been approved by the Textile Division Council.

**0.2** Due to considerable use of paper coated high density polyethylene woven sacks in recent years for packing skim milk powder, the Committee felt an urgent need for formulating an Indian Standard on the subject for ensuring the supply of such important food item to the consumer in proper condition.

**0.3** In this specification, two types of paper coated HDPE woven sacks for packing skim milk powder or partly skim milk powder ( roller dried only ) have been covered. Type 1 is recommended for use where the sacks are likely to be exposed to more severe handling and transportation conditions.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1. SCOPE

**1.1** This standard prescribes the requirements for two types of paper coated HDPE woven sacks suitable for packing 25 kg skim milk powder or partly skim milk powder ( roller dried only ).

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*Rules for rounding off numerical values ( *revised* ).

## 2. TERMINOLOGY

**2.0** For the purpose of this standard, the following definitions shall apply.

**2.1 Flat Sack** — A sack manufactured from a flat tube.

**2.2 Gusset** — A fold inserted in the longitudinal edge of a tube or sack.

**2.3 Gussetted Sack** — A sack manufactured from a gussetted tube.

**2.4 Heat Sealing ( Welding )** — Joining together by the application of heat.

**2.5 Open Mouth Sack** — Tube closed at one end only during manufacturing.

**2.6 Sewn Sack** — A sack closed at one or both ends by means of a continuous transverse line of stitches.

## 3. MATERIAL

**3.1 Paper** — The paper used for cutting HDPE woven sack shall be kraft paper having minimum substance of 80 g/m$^2$, and other properties conforming to Grade I kraft paper as per IS : 1397-1967*.

**3.2 HDPE Woven Fabric** — The HDPE woven fabric laminated to the sack paper shall be made from monoaxially oriented high density polyethylene tapes of minimum 800 denier and conforming to IS : 6192-1984†. The minimum ends and picks per centimeter in the fabric shall be 4 for circular woven fabric and 5 for flat bed loom woven fabric.

**3.3 Low Density Polyethylene Film** — LDPE film of minimum coating mass of 35 g per square metre and conforming to IS : 2508-1984‡ shall be used for bonding HDPE woven sack with kraft paper.

**3.4 Inner Liner** — The liner used shall be made of polyethylene film and shall conform to the requirements as given in Table 1.

## 4. MANUFACTURE

**4.1 Construction** — The sack paper and HDPE woven fabric as prescribed in **3.1** and **3.2** shall be joined together by using low density polyethylene film as a bonding medium. The requirement of LDPE film shall be as prescribed in **3.3**. The bonding may be done by heat sealing method. The inner liner made of polyethylene film as prescribed in **3.4** shall be of tubular construction with a heat sealed portion of

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*Specification for kraft paper ( *first revision* ).

†Specification for monoaxially-oriented high-density polyethylene tapes ( *first revision* ).

‡Specification for low density polyethylene films ( *second revision* ).

minimum 5 mm wide at the bottom. If required by the buyer, the liner shall be stitched to the bottom of the bag. In that case, the stitching shall be at a distance of minimum 25 mm below the bottom seat of the liner. The length of the liner shall exceed the length of sack by 10 cm, *Min*.

**TABLE 1 REQUIREMENTS OF POLYETHYLENE LINER**

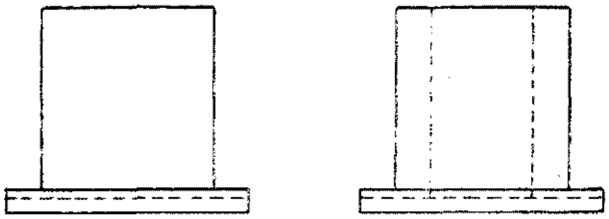
( *Clauses* 3.4 *and* 5.2.1 )

| SL No. | CHARACTERISTIC | REQUIREMENT | METHOD OF TEST |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Thickness, *Min*, micron | 37 | A-2 of IS : 2508-1984* |
| ii) | Water vapour transmission rate ( permeability ), $g/m^2/24$ h, *Max* | 5·5 | IS : 1060 ( Part 2 )-1960† |
| iii) | Tensile strength, $kg/cm^2$, *Min* | MD-429<br>CD-268 | A-4 of IS : 2508-1984* |

*Specification for low density polyethylene films ( *second revision* ).
†Methods of sampling and test for paper and allied products, Part 2.

## 4.2 Style

**4.2.1** The sacks may be of open mouth, sewn, flat type or open mouth, sewn, gussetted type ( *see* Fig. 1 ).



1A Open Mouth Sewn Flat Type Sack

1B Open Mouth Sewn Gussetted Type Sack

FIG. 1

## 4.3 Stitching

**4.3.1** Cotton, rayon or any other suitable thread having a minimum breaking strength of 70 N when tested as per IS : 1670-1970* shall be used for stitching the sack. The sacks shall be stitched at the sides and at the bottom with two rows of chain or lock stitches separated from each other by about 5 mm after maintaining a minimum distance of 10 mm from the edge of the sack to the outer row of stitching. The number of stitches shall be 12 ± 2 per decimetre.

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*Method for determination of breaking load, elongation at break and tenacity of yarns ( *first revision* ).

## 5. REQUIREMENTS

### 5.1 Requirements of Paper Coated HDPE Woven Sack

**5.1.1** The breaking load of paper coated HDPE woven sacks of Type 1 and Type 2 shall conform to the requirements as given in Table 2.

**TABLE 2 REQUIREMENTS OF PAPER COATED HDPE WOVEN SACKS FOR PACKING SKIM MILK POWDER**

| SL No. | CHARACTERISTIC | REQUIREMENT N*, *Min* | | METHOD OF TEST |
|---|---|---|---|---|
| | | Type 1 | Type 2 | |
| (1) | (2) | (3) | (4) | (5) |
| i) | Breaking load on 5·0 × 20 cm strips: | | | |
| | a) Warpway ( lengthwise ) | 850 | 700 | IS : 1969-1985† ( cut strip test method only ) |
| | b) Weftway ( widthwise ) | 680 | 600 | |
| ii) | Seam breaking load: | | | |
| | a) Side seam | 390 | 390 | IS : 9030-1979‡ |
| | b) Bottom seam | 310 | 310 | |

*1N = 0·102 kgf ( approx ).

†Method for determination of breaking load and elongation of woven textile fabrics ( *second revision* ).

‡Method for determination of seam strength of jute fabrics including their laminates.

**5.1.2** The outside dimensions of HDPE sacks shall be as agreed to between the buyer and the seller subject to a tolerance of ±5 mm for length, width and gusset width of bags. However, most commonly used dimensions for holding 25 kg skim milk powder are given below for the guidance of manufacturers and the users. These dimensions are meant for maintaining an optimum free space of minimum 10 percent of length when measured along the surface of the sack from the mouth stitch line up to the surface level of the contents:

| *Sl No.* | *Gussetted Sack* | | | *Flat Sack* | |
|---|---|---|---|---|---|
| | Length ( cm ) | Width ( cm ) | Gusset ( cm ) | Length ( cm ) | Width ( cm ) |
| 1. | 101·5 | 42·0 | 7·5 | 101·5 | 49·5 |
| 2. | 91·5 | 42·0 | 12·5 | 91·5 | 54·5 |

### 5.2 Requirements of Polyethylene Liner

**5.2.1** The thickness, water vapour transmission rate and tensile strength of polyethylene liner for both Type 1 and Type 2 sacks shall conform to the requirements laid down in Table 1.

## 6. PACKING AND MARKING

**6.1** The sacks shall be marked with information as required by the buyer using suitable ink.

NOTE — The common practice of marking involves the use of silk screens or stencils for printing the matter when the number of sacks ordered is small. When large number of sacks are required, the normal accepted method is flexo-printing. The inks found suitable for printing are those based on polyamide resins. The shade of the inks should not vary from sack to sack.

**6.2** 100 sacks or multiples thereof shall be packed to constitute a truss which shall be formed using a layer of HDPE woven fabric or hessian, and suitably secured as agreed to between the buyer and the seller.

### 6.3 BIS Certification Marking

The product may also be marked with Standard Mark.

**6.3.1** The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 7. SAMPLING

**7.1** In any consignment, all the sacks of the same construction shall be grouped together to constitute a lot.

**7.2** The conformity of the lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from it.

**7.3** Unless otherwise agreed to between the buyer and the seller, the number of trusses to be selected at random from a lot shall be according to col 1 and 2 of Table 3.

**7.4 Number of Tests** — The number of sacks to be selected for testing the requirements of polyethylene liner, construction, dimensions and stitching shall be according to col 3 of Table 3. Equal number of sacks shall be selected from each truss.

**TABLE 3 SAMPLE SIZE AND CRITERIA FOR CONFORMITY**

( *Clause* 7.3 )

| No. of Trusses in the Lot (1) | No. of Trusses to be Selected (2) | No. of Sacks to be Selected (3) | Permissible No. of Defective Sacks (4) |
|---|---|---|---|
| 1 | 1 | 5 | 0 |
| 2 | 2 | 8 | 0 |
| 3 to 6 | 3 | 12 | 0 |
| 7 to 20 | 5 | 20 | 1 |
| 21 to 70 | 8 | 32 | 2 |
| 71 and above | 13 | 52 | 3 |

**7.4.1** The number of sacks to be selected for testing the breaking load of coated fabric as well as seam shall be one per truss selected according to col 2 of Table 3 subject to a minimum of two sacks.

### 7.5 Criteria for Conformity

**7.5.1** The lot shall be considered conforming to the requirements given in **5.1.2** and **5.2** if the number of sacks not meeting the requirement for any one or more of the characteristics is less than or equal to the corresponding permissible number of defective sacks given in col 4 of Table 3.

**7.5.2** The lot shall be considered conforming to the requirements given in **5.1.1** if all the sacks selected for testing according to **7.4.1** meet the relevant requirements.

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